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Reply to: 3460 January 12, 1989

Subject: American beech mortality within the Salsbury Opportunity Area

To: District Ranger, Greenbrier Ranger District

We were requested to provide information on the current impact of beech bark disease on the American beech resource within the Salsbury Opportunity Area (OA). Aerial photography was used to rate the amount of hardwood mortality in stands with a component of American beech.

Methods: A database was constructed at the Morgantown Field Office which listed all stands within Greenbrier Ranger District with an American beech component. The Salsbury OA has American beech located in compartment 108 and 110. The amount of mortality was rated from aerial photography for only those stands which had at least ten square feet per acre of American beech.

High altitude panoramic aerial (1:30,000 scale) color infrared photography was acquired on June 11, 1988. The procedure for aerial photograph interpretation followed Mielke et al. (1984) and Acciavatti and Dropp (1986). Each stand was rated (see Table 1) according to the methods developed by Acciavatti and Dropp (1986).

No ground data was taken to determine the accuracy of the aerial photography interpretation, but good results were achieved within the Gaudineer OA. The Gaudineer OA and the Salsbury OA were examined at about the same time by one aerial photograph interpreter. Therefore, the results for the Salsbury OA should be as accurate as the Gaudineer OA.

Results and Discussion: Our VIMIS data listed American beech was present within 39 stands (838 acres) of the Salsbury OA. Fourteen stands (277 acres) had at least ten square feet of American beech per acre. One stand had no mortality observed using the aerial photographs. Table 2 lists the mortality rating for each of the remaining 13 stands. Figures 1A and 1B show the distribution of stands classified with light and moderate mortality. The Salsbury OA should be classified in the killing front because heavy beech scale populations are known to occur within seven miles of the OA, and mortality has begun in some stands (see Figures 1A and 1B, and Table 2) (Houston and O'Brien, 1983). Mortality of the American beech will continue over the next ten years.

Recommendations: Beech bark disease mortality will continue to increase within the Salsbury OA. The economic impact on the timber resource by the disease will probably not be significant. Beech bark disease may have an

impact on certain wildlife species (such as grouse, turkey, bear and deer) which may depend upon the mast crop. Also, if American beech sprouts from susceptible parents are not removed, then a potential exits in the future to increase the problem caused by this disease (Houston, 1975). The following recommendations (Mielke et al., 1986) should be applied to as many stands as possible:

1. Salvage dead, declining (thin crowned, chlorotic) trees, especially hazard trees.

2. Monitor insect and disease condition.

3. Salvage trees with heavy scale populations and trees with signs of Nectria spp.

4. Treat infested understory or sprouts associated with heavily infested overstory.

5. Leave trees and their root sprouts with little or no scale and no signs of Nectria spp.

Permanent Plots: No beech bark disease permanent plots or red spruce Trend/ Symptomatology plots are located within the Salsbury OA.

Please contact me (304-291-4133) if you have any questions, or need further assistance.

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Literature Cited

Acciavatti, Robert E. and Elizabeth R. Dropp. 1986. Beech Bark Disease Damage Evaluations, Bradford Ranger District, Allegheny National Forest, Pennsylvania. Biological Evaluation 3440. USDA Forest Service, Forest Pest Management. 50pp.

Houston, David R. 1975. Beech Bark Disease: The Aftermath Forests Are Structured for a New Outbreak. Journal of Forestry. 73(10): 660-663.

Houston, David R. and James T. O'Brien. 1983. Beech Bark Disease. USDA Forest Service, Forest and Disease Leaflet 75, 8 pp.

Mielke, M. E., W. M. Ciesla, and R. J. Myhre. 1984. Inventory of beech bark disease mortality and decline on the Monongahela National Forest, West Virginia. USDA Forest Service, Forest Pest Management/Methods Application Group, Ft. Collins, CO. Rpt. No. 84-4, 15 pp.

Mielke, Manfred E., David R. Houston and Allan T. Bullard. 1986. Beech Bark Disease Management Alternatives. In: Proceedings Integrated Pest Management Symposium for Northern Forests; 1986 March 24-27; Madison, Wisconsin. pp 272 - 280.

Table 1. Decision criteria for beech bark disease damage classes*/.

BEECH BARK DISEASE DAMAGE INTENSITY CLASS	DESCRIPTION
Light	< 10% OF TREES DEAD AND DYING
Moderate	10 - 25% OF TREES DEAD AND DYING
Severe	> 25% OF TREES DEAD AND DYING

BEECH BARK DISEASE DAMAGE FREQUENCY CLASS	DESCRIPTION
Clustered	< 30% OF STAND AREA
Partial	30 - 60% OF STAND AREA
Widespread	> 60% OF STAND AREA

The damage class for each stand was labeled in Table 2 using the following coding matrix:

CODING MATRIX FOR BEECH BARK DISEASE DAMAGE CLASSES

INTENSITY CLASS	CLUSTERED	PARTIAL	WIDESPREAD
Light	LC	LP	LW
Moderate	MC	MP	MW
Severe	SC	SP	SW

*/ Taken from Acciavatti and Dropp (1986). The beech bark disease damage frequency class "Clustered" was originally referred to as "Scattered".

Table 2. Damage classes*/ for stands**/ with ten square feet per acre of American beech in compartments 44, Salsbury Opporutunity Area, Greenbrier Ranger District, Monongahela National Forest, 1988.

Damage Compartment	Stand	Acres	Total Stand Basal Area (sq. ft. / ac.)	Total American Beech Basal Area (sq. ft. / ac.)	Class
108	3	84	120	13	LP
	7	14	130	15	MP
	10	8	100	10	LP
	11	7	120	36	LP
	12	22	150	12	MP
	34	12	100	16	MP
	52	18	110	24	MP
110	16	10	130	16	none
	26	30	130	18	LC
	27	8	120	18	LC
	47	8	130	30	LP
	48	6	150	30	LC
	56	32	140	25	LC
	70	18	110	28	LC

*/ See Table 1 for damage class codes.

**/ Stand acres and basal area estimates taken from VIMIS.

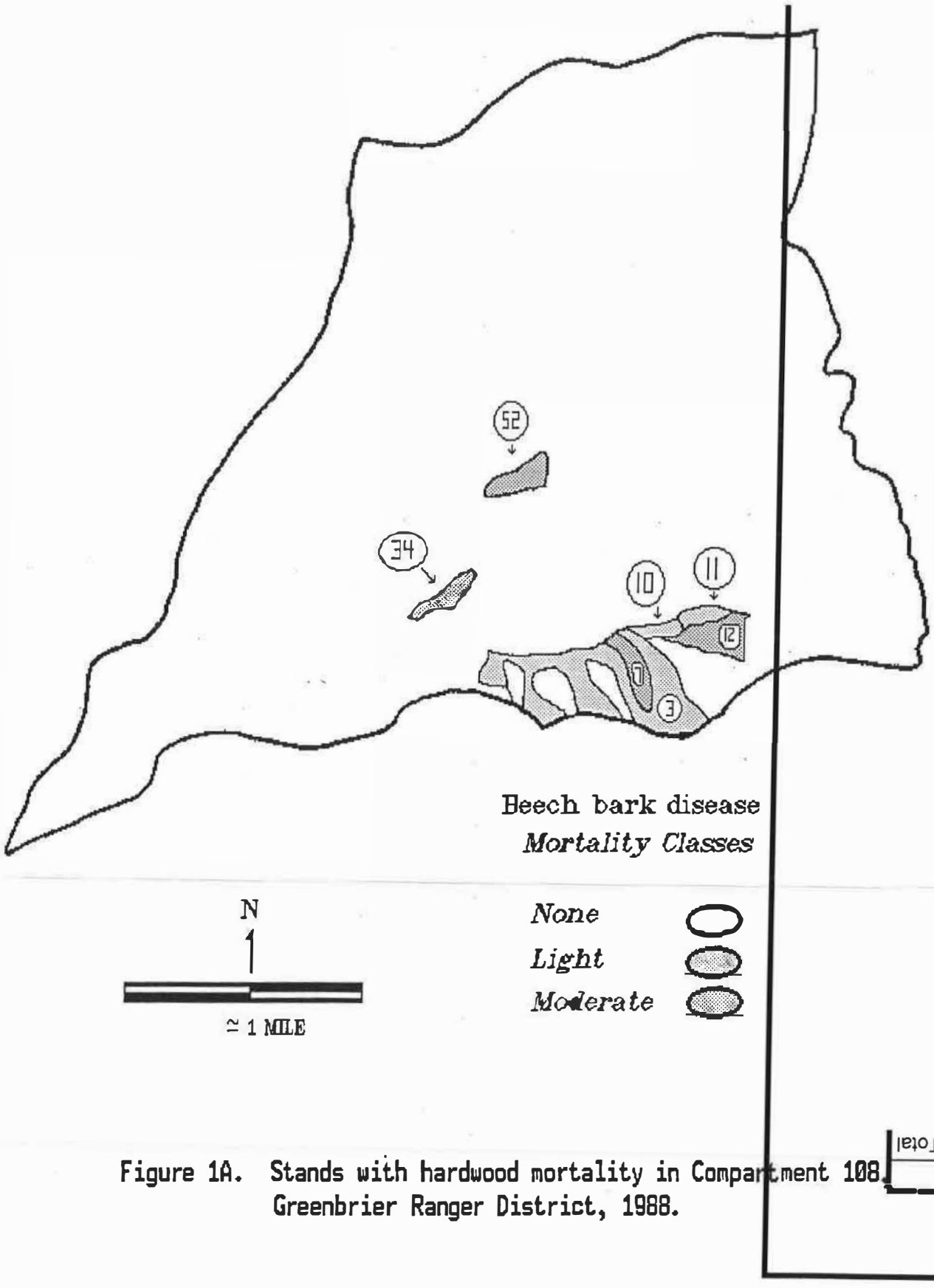

Figure 1A. Stands with hardwood mortality in Compartment 108, Greenbrier Ranger District, 1988.

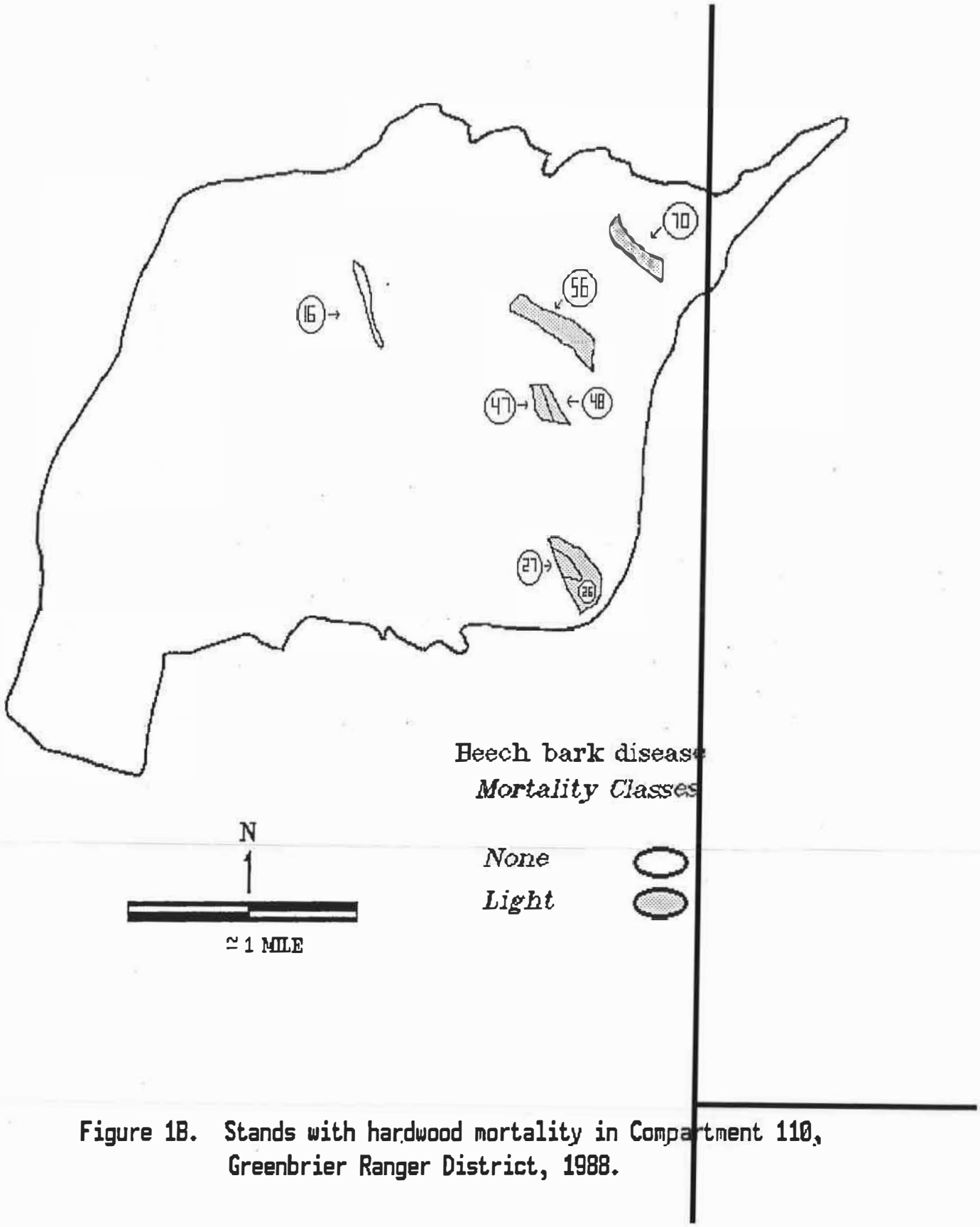

Figure 1B. Stands with hardwood mortality in Compartment 110, Greenbrier Ranger District, 1988.